



GENESIS: GPS ENvironmental & Earth Science Information System

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WORKSHOP ON LEO MISSIONS

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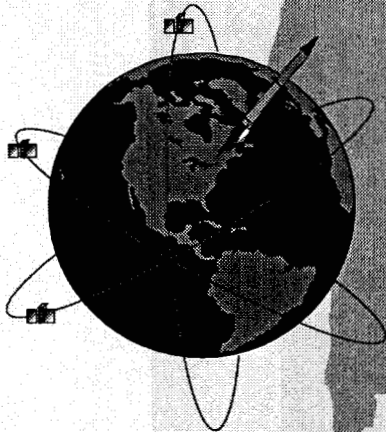


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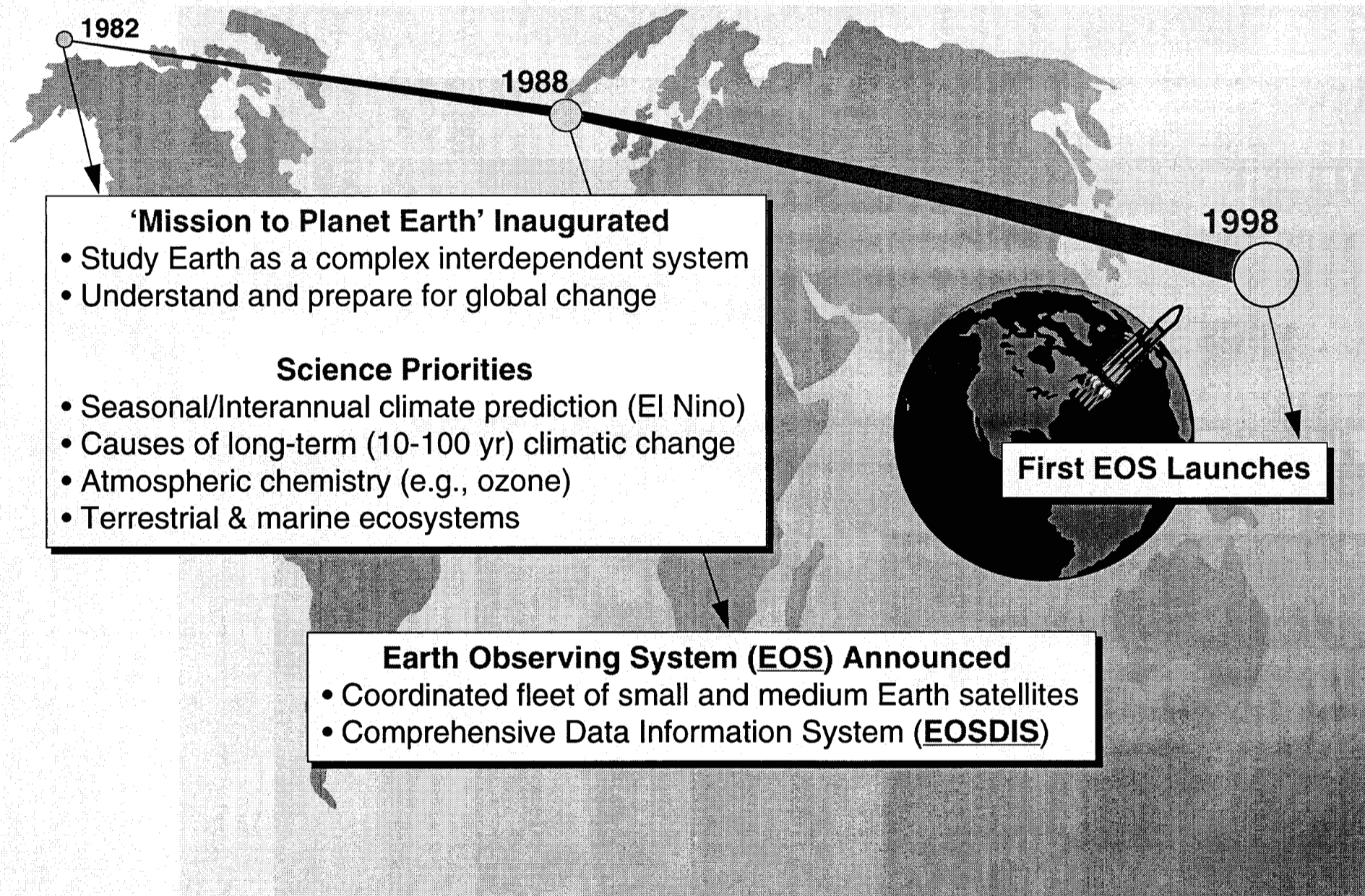
GPS: The Global Positioning System

**Partners: JPL (Project Leader: Tom Yunck)
USC/IMSC (Info Systems Lead)
Texas A&M (Science Co-Lead)
Goddard Inst. (Science Co-Lead)
University of Wisconsin
Columbia University**

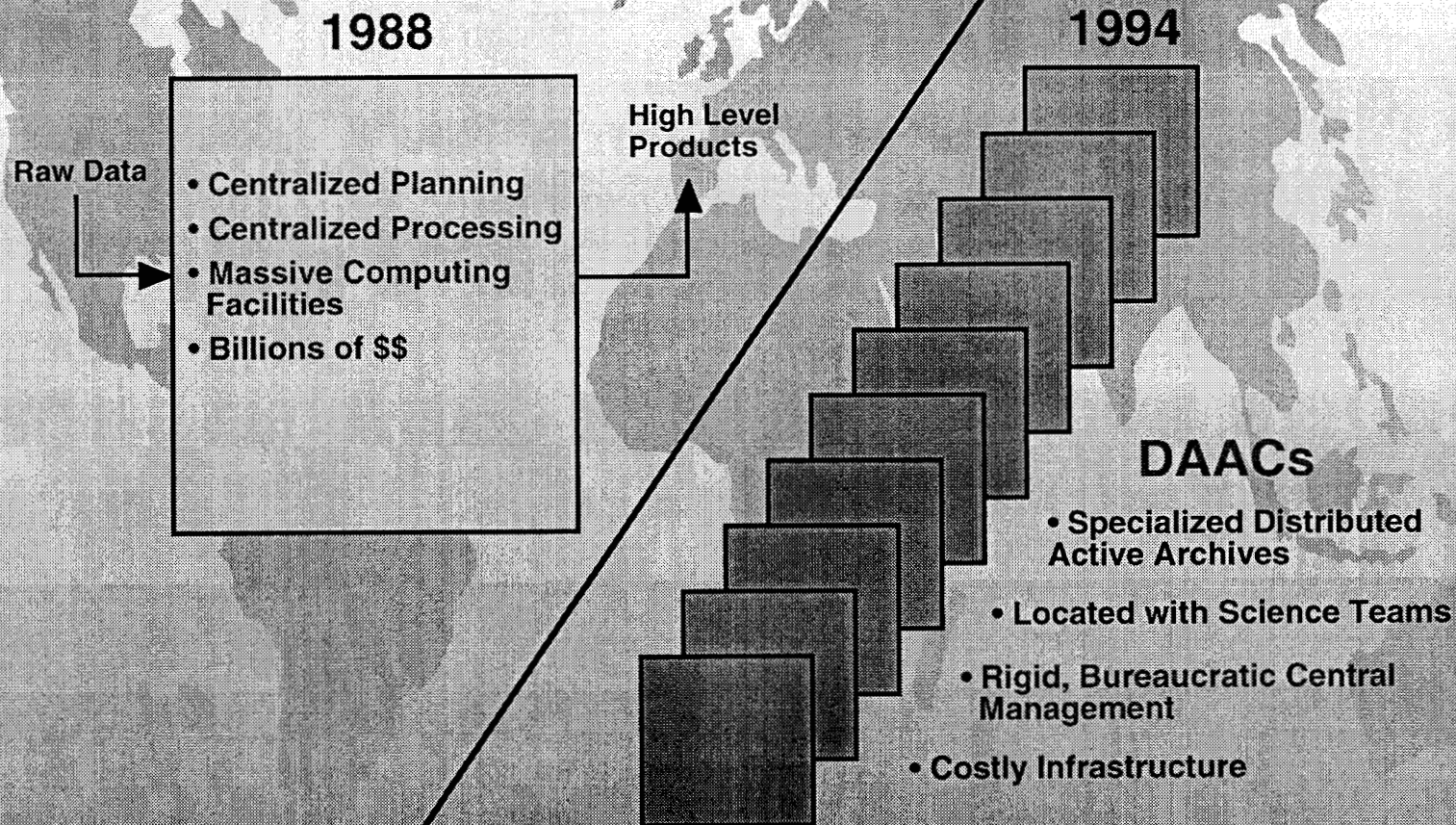




EARTH SYSTEM SCIENCE AT NASA

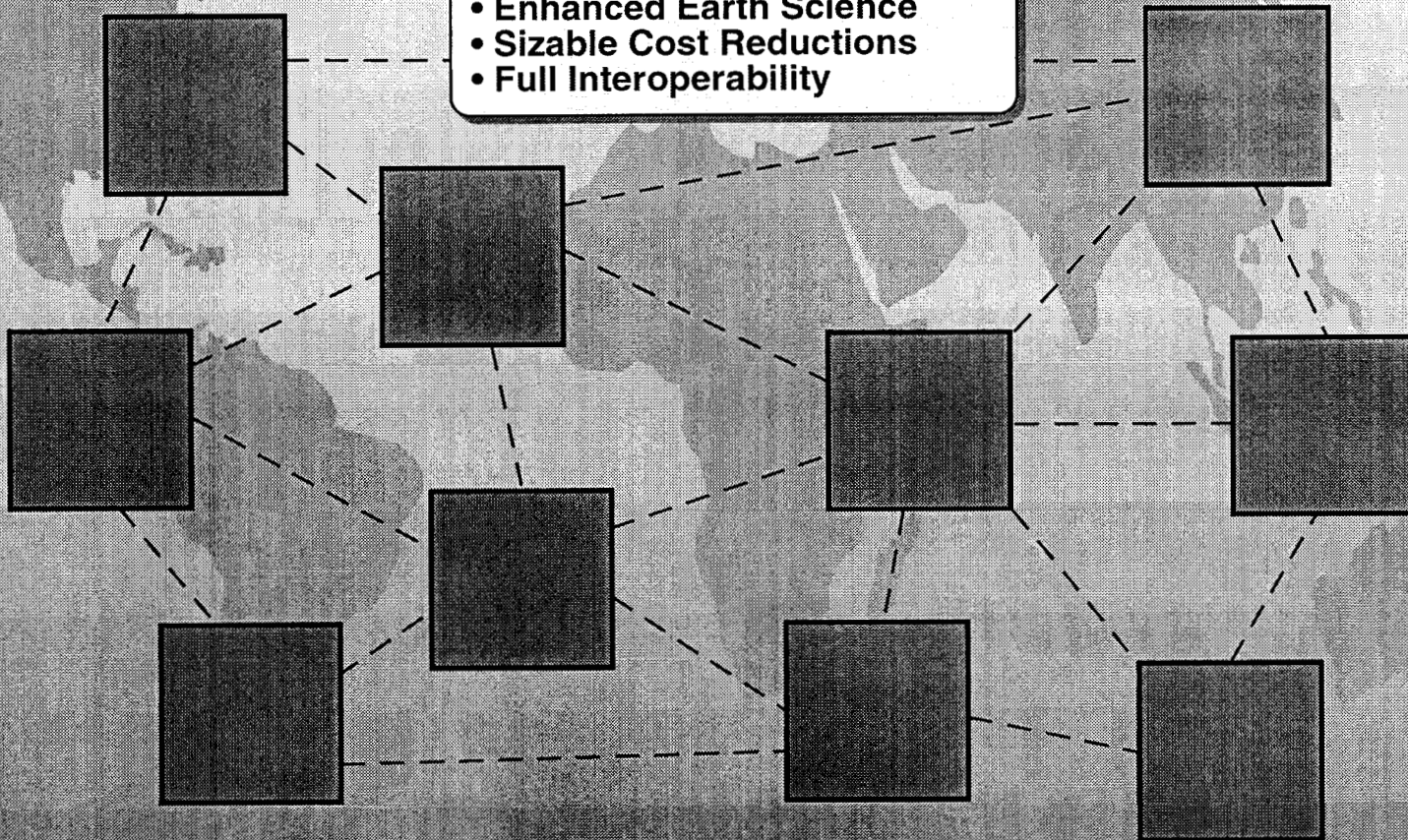


PAST CONCEPTS FOR EOSDIS



1997: “Earth Science Information Partners” (or, ‘You figure it out’)

- Self-Governing Federation
- Innovative Info Technologies
- Enhanced Earth Science
- Sizable Cost Reductions
- Full Interoperability



Objective of Genesis

- ◆ Data archiving, searching & distribution for science data products derived from:
 - Space-borne TurboRogue Space Receivers for GPS science
 - Other ground-based GPS receivers
- ◆ Data browsing using integrated visualization tools
- ◆ Interactive web/java-based data search & retrieval
- ◆ Data subscription service
- ◆ Data migration from existing GPS archived data
- ◆ On-line help and documentation
- ◆ Participation in the WP-ESIP Federation

GENESIS Products & Services

Focus on Atmospheric Occultation Products

- Profiles of refractivity, density, pressure, temp, moisture
- User-specified time and spatial averages of the above
- Global pressure contours, gradients, and derived winds
- Tropopause and boundary layer heights

Other User Services

- Versatile search and query across data centers
- Data subscription: automated notification & delivery
- Powerful data visualization tools: Vis-AD
- Downloadable science analysis tools
- Experimental “data mining” functions
- User-contributed products and tools
- Information: tutorials, papers, FAQs, helpline
- Online publishing

BASELINE TECHNOLOGY

◆ Distributed Object Management (DOM) System

- JPL home grown & currently operational
- File-based archive management system
- API and Web-based interface for search engine
- Data distribution via FTP

◆ Others:

- Data visualization tools (University of Wisconsin-Madison)
- Object-oriented database technology (USC)
- Future research to provide:
 - ◆ time series analysis
 - ◆ feature extraction
 - ◆ discriminant analysis
 - ◆ pattern recognition

Other GENESIS Features

- Pilot derived from JPL's Distributed Object Manager
- Product system based initially on file management
- Search system based on high performance DBMS
- Will evolve into a true object-oriented system in 2 yrs
- Will draw from latest commercial & research systems:
 - INFORMIX™ Universal Server
 - Oracle-8
 - Paradise (U. Wisc.)
- Adopts Hierarchical Data Format (HDF)
- Web-based interface emphasizes Java applets
- Metadata is human-readable, machine parseable
- Allows versatile subsetting and user-specified actions
- Enforces intelligent demand control